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Renormalized Tight-Binding Model of Kondo Semimetal CeNiSn

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Structure of quasiparticles of Kondo semimetal CeNiSn is calculated by the renormalized tight-binding model which takes into account the local trigonal symmetry of crystalline-electric-field around Ce ion and the dynamical renormalization effect leading to the mass enhancement. The results are consistent with those by Ikeda and Miyake* who adopted the plane wave state as that of conduction electrons, and can be regarded as its verification. Structure factor of hybridization arises from the hopping between $4f(j_z = \pm 3/2)$ orbital of Ce and $3d(d_{zx}$ and $d_{yz})$ orbitals of Ni surrounding Ce ion. On the basis of periodic Anderson model, the density of state near the Fermi level and the renormalized self energy $\Sigma(k; 0)$ are calculated.

*H. Ikeda and K. Miyake, J. Phys. Soc. Jpn. **65** (1996) 1769